

Mechanical Maintenance Specialist Certificate

The Mechanical Maintenance Specialist pathway is for students who want to concentrate on the mechanical aspects of contemporary industry. Courses in this program include Hydraulic and Pneumatic power systems along with Pipefitting and Tube Bending. The Mechanical Maintenance Specialist will also study power transmission, machine rigging and leveling, shaft alignment and lubrication. Mechanical systems are the backbone of modern industry and this program is designed to provide students the needed expertise to install, troubleshoot and repair these essential mechanisms. A student may choose to take a Siemens Mechatronic Systems Certification Level 1 exam.

Please note: The Manufacturing Essentials Program is a Pre-Requisite to entering this program. This pre-req may be waived based on experience or successful completion of a hands-on assessment in these areas. Assessment to be completed at the expense of the student.

Non-Credit Course Code	Course Title	Hours	Days
CELC 8013	Electrical Fundamentals	40	5
CMNF 8236	Rigging & Machine Leveling	40	5
CMNF 8271	Shaft Alignment & Vibration Analysis	16	2
CMNF 8266	Lubrication	16	2
CMNF 8053	Hydraulics Fundamentals	40	5
CMNF 8207	Pneumatics Fundamentals	40	5
CMNF 8240	Pipefitting & Tube Bending	40	5
CMNF 8166	Mechanical Systems/ Power Transmission	40	5
A certificate of completion will be awarded to students who successfully complete the above courses.		272 hours	34

Non-Credit Course Descriptions

Electrical Fundamentals– CELC 8013 – 40 hours

Prerequisite: None

This forty (40) hour training course covers the basics of AC (Alternating Current) and DC (Direct Current) theory and fundamentals. The student will first gain an understanding of the concepts of electrical schematics, components, voltage, current and resistance. These fundamentals will then be applied through Ohm's Law to basic circuit design and analysis. Power, magnetism and DC generation will also be introduced to complete the theories of DC applications.

Rigging & Machine Leveling - CMNF 8236 – 40 hours

Prerequisite: None

This forty (40) hour course is designed to provide skills in Rigging and Machine leveling. The course provides an understanding of rigging safety and equipment used in rigging applications. Course topics include rigging gear, inspection, load calculations, leveling equipment, planning and manipulating equipment moves.

Shaft Alignment/ Alignment & Vibration Analysis – CMNF 8271 - 16 hours

Prerequisite: None

This sixteen (16) hour course is designed to provide the necessary skills needed to identify components and best practices used in machine alignment. The students will obtain an understanding to machine equipment layout, leveling fundamentals, and laser alignment techniques. Also, an overview of vibration analysis will be provided for the students to understand how to collect basic vibration analysis data using vibration analysis equipment.

Lubrication – CMNF 8266 - 16 hours**Prerequisite: None**

This sixteen (16) hour training course will provide trainees with an understanding of pumps, seals, bearings, and lubrication. Through lecture and hands on exercises, trainees will develop an understanding of the use of these components, including the properties of different lubricants. Trainees will recognize various types of lubrication systems and their maintenance requirements, as well as understand how they operate. Participants also learn the importance of following lubrication schedules. Trainees will also understand how to handle and store lubricants to prevent lubricant contamination.

Hydraulics Fundamentals – CMNF 8053 – 40 hours**Prerequisite: CMTH 8008/Shop Math**

This forty (40) hour course is designed to provide the participant with the understanding of hydraulics technology, componentry, component variables, symbology, fundamental print reading, simple and moderate circuit dynamics and fluids/filtration fundamentals.

Pneumatics Fundamentals – CMNF 8207 – 40 hours**Prerequisite: CMTH 8008/Shop Math**

This forty (40) hour course is designed to provide skills in pneumatics fundamentals. The course provides an understanding of pneumatics circuits and applications. Course topics include basic laws, pneumatic components and troubleshooting common pneumatic components.

Pipefitting & Tube Bending – CMNF 8240 – 40 hours**Prerequisite: None**

This forty (40) hour course is designed to provide skills in pipefitting and tube bending. The course provides an understanding of piping drawings, component identification, and equipment used in pipefitting and tube bending applications. Course topics include pipefitting, methods of tube bending, pipe materials, joints, fittings, and pipe hangers and support applications.

Mechanical Systems/Power Transmission – CMNF 8166 – 40 hours**Prerequisite: None**

This forty (40) hour course is designed to provide skills in mechanical power transmission systems. The course provides an understanding of mechanical systems and drives of power transmission mechanical equipment. Course topics include safety, chain drives, sprockets, belt drives, gears, motors, clutches, and couplings.

Optional Courses:

CELC 8016	Digital Electronics	CMNF 8285	Intermediate PLC - 1
CELC 8012	Motor Controls and Drives	CMNF 8279	Intermediate PLC - 2
CMNF 8241	FANUC Robotics Operations	CMNF 8280	Advanced PLC Maintenance and Troubleshooting
CMNF 8247	Basic PLC	CMNF 8239	Automated System Troubleshooting

Upon successful completion of the Mechanical Maintenance Specialist Pathway and the optional courses, a student may choose to take a Siemens Mechatronic Systems Certification Level 1 exam.
